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UNITED STATES DEPARTMENT OF AGRICULTURE



1982 BARC

***GUIDELINES FOR MEAT ANIMAL  
HEALTH AND CARE***

BELTSVILLE  
AGRICULTURAL  
RESEARCH  
CENTER

Beltsville,  
Maryland

Agricultural Research Service  
NORTHEASTERN REGION



**United States  
Department of  
Agriculture**



**National Agricultural Library**

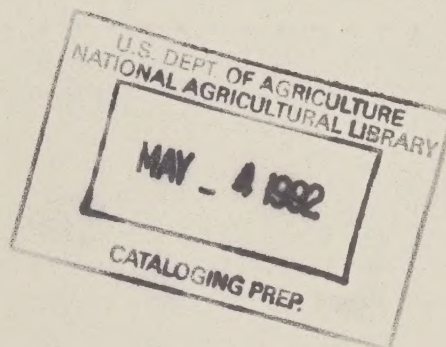
## INTRODUCTION

A committee was established by the Center Director in 1975 to develop guidelines for the care and health of meat animals at BARC. The Center Director directed the committee to take responsibility for "advising scientists, research leaders, and all levels of management in matters pertaining to care, humane treatment, and use of meat animals" in the various research programs at BARC. The committee is to "meet quarterly" to "develop and maintain active progressive animal care programs," to "inspect all meat animal facilities annually and make a comprehensive report on the status of animal care to the Center Director and Institute Chairmen." The "committee will develop programs to insure attainment of desired standards."

These guidelines represent a major revision of guidelines developed in 1975. We have attempted to develop meaningful guidelines that can be used by scientists and animal caretakers alike. Recognizing that no guideline can cover all aspects of the area, we have included lists of appropriate references so that information relative to a particular species or guideline can be expanded. We urge each scientist and animal caretaker to take animal care and health seriously and use this document to help achieve optimum animal health and care of meat animals at BARC.

### BARC Meat Animal Care Committee

R. Bradbury	November 1982
N. Hooven	
L. Johnson, Chairperson	
P. Moe	
N. Steele	
B. Stroud, Veterinary Medical Officer	





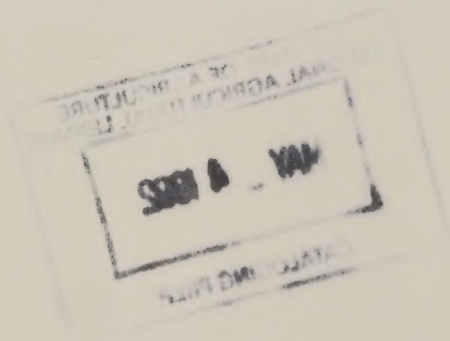
INTRODUCTION

A committee was established by the Center Director in 1972 to develop guidelines for the care and use of non-human primates. The Center Director directed the committee to take responsibility for "establishing a policy, research, and educational program, and for the management of animals used in research, teaching, and care, human treatment, and use of non-human primates in the various research programs at SARC. The committee is to have authority to recommend and maintain active programs in animal care, research, and education. The committee will report annually to the Center Director and to the Board of Directors. The committee will develop a program to insure the highest standards of animal care."

These guidelines represent a major step in the development of animal care at SARC. We have attempted to develop standards which can be used by researchers and animal care personnel. We believe that the guidelines can cover all aspects of the area. We have included lists of responsibilities and cover all information relative to the use of non-human primates. We have also included a list of responsibilities for animal care and research. We have also included a list of responsibilities for animal care and research. We have also included a list of responsibilities for animal care and research.

SARC Animal Care Committee

- 1. Dr. [Name]
- 2. Dr. [Name]
- 3. Dr. [Name]
- 4. Dr. [Name]
- 5. Dr. [Name]
- 6. Dr. [Name]
- 7. Dr. [Name]
- 8. Dr. [Name]
- 9. Dr. [Name]



# GUIDELINES FOR MEAT ANIMAL HEALTH AND CARE AT BARC

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## BARC QUARANTINE REGULATIONS

The following quarantine regulations have been authorized by the Center Director and shall be observed by all BARC employees and visitors.

1. The Beltsville Agricultural Research Center (BARC), with the exception of the Animal Parasitology Institute (API), will be considered as a unit. Employees will not be required to take special precautions in moving within the unit.
2. In the event of a disease outbreak, the Veterinary Medical Officer will initiate whatever quarantine procedures he may deem necessary to control the spread of disease.
3. Security measures as related to visitors:
  - a. It is recommended that all visits be arranged in advance with the BARC Visitor Center. Individuals may arrange visits with BARC staff; however, it will be the responsibility of the staff member to adhere to the following regulations and make certain his visitors are properly attired when visiting animal facilities.
  - b. Foreign Visitors:
    1. Foreign visitors shall not have had contact with animals or animal pathogens for at least seven (7) days prior to contact with BARC animals. This includes any visits into barns or other animal enclosures.
    2. All clothing worn during contact with BARC animals should not have been worn during contact with animals or animal pathogens at other facilities, foreign or domestic.
    3. When entering animal facilities or enclosures used by animals, all foreign visitors shall wear protective footwear provided by BARC.
    4. Additional information for foreign visitors may be obtained by referring to APHIS Regulations. No special precautions will be required for domestic visitors not entering animal areas or facilities. All domestic visitors entering barns or areas used by animals are required to wear protective footwear provided by BARC.





5. BARC employees who have any contact with farm animals off the Center shall be required to wear different clothing and footwear when working within animal barns, sheds, or other enclosures on the Center. Conversely, clothing and footwear worn during contact with BARC animals shall not be worn when visiting private or other government farms. No employee of BARC or visitor shall bring non-research animals of any species onto the Center.
6. Livestock purchased for research purposes shall be maintained in a quarantine area for 30 days. During this period, the only persons authorized to have contact with these animals are the assigned animal caretakers and members of the Veterinary Services Unit. Release from quarantine shall be by order of the Veterinary Medical Officer.





## GUIDELINES FOR BEEF CATTLE HEALTH AND CARE PROGRAM

### A. General Guidelines

These animal care standards are to be used as guidelines to provide humane care for experimental beef animals. The care, management, and feeding of these animals is the responsibility of Animal Operations Staff, the Veterinary Medical Officer, and the scientific staff conducting research with this species.

#### 1. General Management

Proper management is defined as any system of housing and care that permits animals to grow, mature, reproduce, or behave normally; and to be maintained in good health with maximum physical comfort.

#### 2. Feed

The feed should be clean, fresh, palatable, free of contaminants and fed to the animal in prescribed amounts; and fed in facilities that are adequately designed to minimize physical injury to the animal and provide ample feeding space on a per animal basis.

#### 3. Water

All animals should have a clean, fresh supply of water on a daily basis. Watering devices should be kept clean on a day-to-day basis and more often, if necessary. Animals on automatic or special waters shall receive special training until they learn to use them. All watering facilities shall be equipped with devices to prevent freezing if electricity is available to the area.

#### 4. Housing

Animals housed in lots, pens, or stalls shall be provided adequate space such as that recommended in the Midwest Plan Service Structural and Environment Handbook (Appendix IV). The housing facility shall be maintained in a clean and dry condition so as to prevent buildup of manure and other material on the animal and to provide good health and maximum comfort. Animals maintained in pasture areas shall be provided with adequate shade; also the pasture shall be kept free of mud holes and other debris that would cause injury. Pasture feeders shall be moved as often as necessary to prevent muddy conditions from developing around them.





## B. Animal Health, Care, and Preventative Disease Program

### Veterinary Care

The program shall include the adoption of those husbandry practices that will be appropriate for each species; frequent observation of all animals by persons qualified to verify health and condition; the availability of qualified veterinary service for those animals found to be ill or injured; and the application of currently accepted measures of prophylaxis and therapy.

#### 1. Disease Prevention and Control

The Herd Health Program will be developed by the station Veterinary Medical Officer and will include the following:

- a. Control of internal and external parasites.
- b. Utilization of appropriate therapy for ill animals.
- c. Annual testing for brucellosis and tuberculosis.
- d. Appropriate immunization programs will be implemented as needed. The current program includes immunizations against Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea (BVD), Parainfluenza (PI<sub>3</sub>), five strains of Leptospirosis, and Clostridial infections.

#### 2. Sanitary Guidelines

##### a. Animal

Clean and sanitize all pens, stalls, lots, feed and watering equipment after removing animals and before introducing a new group. Also, if there is a long time period between the removal of one group and the entry of another group placed in the same pen; the cleaning and sanitizing shall be repeated, especially the feed and water facilities.

In so much as possible, keep all stray dogs, cats, birds, pigeons, and wild animals out of all animal facilities. Maintain an effective rodent, vermin, and fly control program in all animal areas.

##### b. Human

Restrooms and lunchrooms utilized by animal caretakers should be kept clean and neat at all times with food stored in an appropriate facility.

All animal caretakers should be aware of the regulations associated with disease control measures as outlined in BARC's Quarantine Regulations.





### 3. Maternity Management and Newborn Animal Care

Cattle approaching parturition and/or calving should be observed frequently for signs of dystocia or other problems. If trouble develops, call Veterinary staff and provide necessary assistance.

Newborn calves should be fed colostrum as soon after birth as possible; or be sure that they have nursed their dam.

The naval cord should be disinfected with a strong iodine (7%) solution as soon as possible after birth. Obtain birthweight.

If the dam does not accept the calf after birth, dry the calf off, hand feed it colostrum and put it in a dry, well bedded area away from its dam to prevent injury or death.

The cow should be observed frequently for possible post calving problems; milk fever, ketosis, mastitis, metritis, etc.

### C. Quarantine Procedures

#### 1. Guidelines for New Additions to Herd

- a. All animals purchased shall comply with State and Federal regulations as related to health and intrastate and interstate movements before entry at BARC.
- b. During the quarantine period, the animals will be under the direct control of the Veterinary Medical Officer. This control should be flexible enough to allow for the research objectives to be met; however, the period of time the animals remain in quarantine will be controlled by the Veterinary Medical Officer.

### D. Livestock Handling and Transportation Procedures

In handling and moving livestock, care should be taken so as not to expose personnel to injury; this also applies to the animals. The preferred speed when moving animals from one location to another is a slow walk. This especially is true during hot humid weather.

Animal handling equipment, vehicles, and enclosures should be designed to facilitate the safe efficient movement and transportation of livestock.

An excellent source of information related to livestock movement and trucking can be found in the publication: "Livestock Trucking Guide."



## References

1. Guiding Principles in the Care and Use of Animals. American Physiological Society (Appendix II).
2. Structures and Environment Handbook. 1980. Tenth Edition. Midwest Plan Service. Iowa State University, Ames, Iowa 50011.
3. Livestock Trucking Guide. Livestock Conservation Institute, 239 Livestock Exchange Building, South St. Paul, Minnesota 55075.





## GUIDELINES FOR SWINE HEALTH AND CARE PROGRAM

### A. General Guidelines

These animal care standards are to be used as guidelines to provide humane care for experimental swine. The care, management, and feeding of these animals is the responsibility of Animal Operations Staff, the Veterinary Medical Officer, and the scientific staff conducting research with this species.

#### 1. General Management

Proper management is defined as any system of housing and care that permits animals to grow, mature, reproduce, or behave normally; and to be maintained in good health with maximum physical comfort.

#### 2. Feed

The feed should be clean, fresh, palatable, free of contaminants and fed to the animal in prescribed amounts; and fed in facilities that are adequately designed to minimize physical injury to the animal and provide ample feeding space on a per animal basis.

#### 3. Water

All animals should have a clean, fresh supply of water on a daily basis. Watering devices should be kept clean on a day-to-day basis and more often, if necessary. Animals on automatic or special waters shall be monitored until they learn to use them. All watering facilities shall be equipped with devices to prevent freezing if electricity is available to the area.

#### 4. Housing

Animals housed in lots, pens, or stalls shall be provided adequate space such as that recommended in the Midwest Plan Service Structural and Environment Handbook (Appendix V). The housing facility shall be maintained in a clean and dry condition so as to prevent buildup of manure and other material on the animal and to provide good health and maximum comfort. Animals maintained in pasture areas shall be provided with adequate shade; also the pasture shall be kept free of debris that would cause injury. Pasture feeders constructed in the future shall be built in such a way as to avoid muddy conditions from developing around them.





## B. Animal Health, Care, and Preventative Disease Program

### Veterinary Care

The program shall include the adoption of those husbandry practices that will be appropriate for the species (swine); frequent observations of all animals by persons qualified to verify health and condition; the availability of qualified veterinary service for those animals found to be ill or injured; and the application of currently accepted measures of prophylaxis and therapy.

#### 1. Disease Prevention and Control

The Herd Health Program will be developed by the station Veterinary Medical Officer and will include the following:

- a. Control of internal and external parasites.
- b. Utilization of appropriate therapy for ill animals.
- c. Appropriate immunization programs will be implemented as needed. The current program includes immunization with vaccines and bacterins against brucellosis, leptospirosis and erysipelas.

#### 2. Sanitary Guidelines

##### a. Animal

Clean and sanitize all pens, lots, feed, and watering equipment after removing animals and before introducing a new group. Also, if there is a long time period between the removal of one group and the entry of another group placed in the same pen; the cleaning and sanitizing shall be repeated, especially the feed and water facilities.

In so much as possible, keep all stray dogs, cats, birds, and wild animals out of all animal facilities. Maintain an effective rodent, vermin, and fly control program in all animal areas.

##### b. Human

Restrooms and lunchrooms utilized by animal caretakers should be kept clean and neat at all times with food stored in an appropriate facility.

All animal caretakers should be aware of the regulations associated with disease control measures as outlined in BARC's Quarantine Regulations.



### 3. Farrowing and Baby Pig Care

Farrowing crates and/or pen must be cleaned and disinfected. Must be of good design to insure sow and baby pig comfort.

All sows must be washed and disinfected before moving to farrowing crate or pen.

Monitor farrowing and install proper heat lamps. Remove placental material to incinerator. Unless experimental protocol is given to the contrary, the following newborn pig care procedures will be followed: a) clip needle teeth, b) swab navel with iodine solution, c) give iron injection, d) identify (ear notching or tags, etc.), 3) weigh. Check for scours. Follow standard vaccination procedures. Control internal and external parasites from birth to market weight and in all breeding animals.

## C. Quarantine Procedures

### 1. Guidelines for New Additions to Herd

- a. All animals purchased shall comply with State and Federal regulations as related to health and intrastate and interstate movements before entry at BARC.
- b. New stock should be purchased at least 30 days before intended use. Isolate all new purchases for 30 days before adding to herd. During this time, the new stock should be examined for various diseases such as brucellosis, pseudorabies, leptospirosis, mange, lice, and internal parasites. During the isolation period, any necessary testing or vaccination should be administered.
- c. During the quarantine period, the animals will be under the direct control of the Veterinary Medical Officer. This control should be flexible enough to allow for the research objectives to be met; however, the period of time the animals remain in quarantine will be controlled by the Veterinary Medical Officer.

## D. Livestock Handling and Transportation Procedures

In handling and moving livestock, care should be taken so as not to expose personnel to injury; this also applies to the animals. The preferred speed when moving animals from one location to another is a slow walk. This especially is true during hot humid weather.

Animal handling equipment, vehicles, and enclosures should be designed to facilitate the safe efficient movement and transportation of livestock. An excellent source of information related to livestock movement and trucking can be found in the publication: "Livestock Trucking Guide."





## References

1. Diseases of Swine. 1975. H. W. Dunne and A. D. Leman, Editors. Fourth Edition. Iowa State University Press, Ames, IA.
2. Guarded Management for Swine Disease Prevention. 1969. Publication No. 310. Extension Division, Virginia Polytechnic Institute, Blacksburg, VA.
3. Herd Health Program Bulletin. 1966. Ohio State University, Columbus, Ohio.
4. Swine Production. 1976. Fourth Edition. Krider, J. L. and W. E. Carroll.
5. Managing Swine Reproduction. Leif Thompson. 1981. Circular 1190, University of Illinois at Urbana-Champaign, College of Agriculture, Urbana, Illinois.
6. Structure and Environment Handbook. 1980. Tenth Edition. Midwest Plan Service, Iowa State University, Ames, Iowa.
7. Livestock Trucking Guide. Livestock Conservation Institute. South St. Paul, Minnesota.





## GUIDELINES FOR SHEEP HEALTH AND CARE PROGRAM

### A. General Guidelines

These animal care standards are to be used as guidelines to provide humane care for experimental sheep. The care, management, and feeding of these animals is the responsibility of Animal Operations Staff, the Veterinary Medical Officer, and the scientific staff conducting research with this species.

#### 1. General Management

Proper management is defined as any system of housing and care that permits animals to grow, mature, reproduce, or behave normally; and to be maintained in good health with maximum physical comfort.

#### 2. Feed

The feed should be clean, fresh, palatable, free of contaminants and fed to the animal in prescribed amounts; and fed in facilities that are adequately designed to minimize physical injury to the animal and provide ample feeding space on a per animal basis.

#### 3. Water

All animals should have a clean, fresh supply of water on a daily basis. Watering devices should be kept clean on a day-to-day basis and more often, if necessary. Animals on automatic or special waters shall receive special training until they learn to use them. All watering facilities shall be equipped with devices to prevent freezing if electricity is available to the area.

#### 4. Housing

Animals housed in lots, pens, or stalls shall be provided adequate space such as that recommended in the Midwest Plan Service Structural and Environment Handbook (Appendix VI). The housing facility shall be maintained in a clean and dry condition so as to prevent buildup of manure and other material on the animal and to provide good health and maximum comfort. Animals maintained in pasture areas shall be provided with adequate shade; also the pasture shall be kept free of mud holes and other debris that would cause injury. Pasture feeders shall be moved as often as necessary to prevent muddy conditions from developing around them.



## B. Animal Health, Care, and Preventative Disease Program

### Veterinary Care

The program shall include the adoption of those husbandry practices that will be appropriate for the species (sheep); frequent observation of all animals by persons qualified to verify health and condition; the availability of qualified veterinary service for those animals found to be ill or injured; and the application of currently accepted measures of prophylaxis and therapy.

#### 1. Disease Prevention Control

The Herd Health Program will be developed by the station Veterinary Medical Officer and will include the following:

- a. Control of internal and external parasites.
- b. Utilization of appropriate therapy for ill animals.
- c. Appropriate immunization programs will be implemented as needed. The current program includes immunization with vaccines and bacterins against Ovine Contagious Ecthyma, clostridial infections, and pasteurellosis.
- d. A bi-monthly examination must be given in the prevention and treatment of foot problems by trimming, foot baths, and other appropriate therapy.

#### 2. Sanitary Guidelines

##### a. Animal

Clean and sanitize all pens, stalls, lots, feed, and watering equipment after removing animals and before introducing a new group. Also, if there is a long time period between the removal of one group and the entry of another group placed in the same pen; the cleaning and sanitizing shall be repeated, especially the feed and water facilities.

In so much as possible, keep all stray dogs, cats, birds, and wild animals out of all animal facilities. Maintain an effective rodent, vermin, and fly control program in all animal areas.

##### b. Human

Restrooms and lunchrooms utilized by animal caretakers should be kept clean and neat at all times with food stored in an appropriate facility.

All animal caretakers should be aware of the regulations associated with disease control measures as outlined in BARC's Quarantine Regulations.





### 3. Maternity Management and Newborn Animal Care

Lambing areas must be kept clean, dry, and well bedded to provide maximum comfort and warmth for the parturient ewe and the newborn lamb.

All ewes must be crutched before lambing.

Infra-red lamps must be provided in lambing jugs during cold weather with ample bedding to prevent chilling.

The placenta should be removed from the pens as soon as possible and disposed of on a daily basis by removal to the post-mortem room (Bldg. 204).

All dead animals shall be removed from pens immediately and taken to the post-mortem room for examination and disposal.

Newborn lambs should be fed colostrum as soon as possible after birth and the naval cord shall be disinfected with a strong iodine (7%) solution. Castration and docking should be accomplished based on experimental requirements by using the appropriate humane techniques. Obtain birthweight.

### C. Quarantine Procedures

#### 1. Guidelines for New Additions to Herd

- a. All animals purchased shall comply with State and Federal regulations as related to health and intrastate and interstate movements before entry at BARC.
- b. During the quarantine period, the animals will be under the direct control of the Veterinary Medical Officer. This control should be flexible enough to allow for the research objectives to be met; however, the period of time the animals remain in quarantine will be controlled by the Veterinary Medical Officer.

### D. Livestock Handling and Transportation Procedures

In handling and moving livestock; care should be taken so as not to expose personnel to injury; this also applies to the animals. The preferred speed when moving animals from one location to another is a slow walk. This especially is true during hot humid weather.

Animal handling equipment, vehicles, and enclosures should be designed to facilitate the safe efficient movement and transportation of livestock. An excellent source of information related to livestock movement and trucking can be found in the publication: "Livestock Trucking Guide."





## References

1. Guiding Principles in the Care and Use of Animals. Approved by the American Physiological Society.
2. Guide for the Care and Use of Laboratory Animals. U.S. Department of Health and Welfare Public Health Service, National Institutes of Health.
3. Nutrient Requirements of Sheep. National Academy of Sciences.
4. Virginia Health Certified Flock Program. Virginia Department of Agriculture and Commerce Division of Animal Health and Dairies.
5. Midwest Plan Service Structures and Environment Handbook. Tenth Edition. 1980: Midwest Plan Service, 122 Davidson Hall, Iowa State University, Ames, Iowa 50011.



APPENDIX IINFORMATION RELATIVE TO FOREIGN VISITORS

Whenever Veterinary Services personnel learn that foreign visitors from countries infected with diseases, such as Rift Valley Fever, Teschen Disease, FMD, Rinderpest, African Swine Fever, Fowl Plague, VVND, etc., will be visiting livestock auction markets, stockyards, animal disease research institutions, or livestock farms in their area, certain precautionary measures should be taken. These include:

- I. Determine as nearly as possible the visitor's expected date of arrival in the United States and advise the area Veterinarian in Charge (VIC).
- II. Determine (from original source of information or your Regional Director) if visitors have been briefed on animal disease prevention; and, if not, a short briefing should be made concerning:
  - A. Information about the freedom from certain major diseases in the United States.
  - B. Security procedures requested of visitors who may have been around animals or animal pathogens in foreign countries before arriving in the United States, such as:
    1. Waiting 7 days after contact with foreign animals or animal pathogens before having close contact with animals in the United States.
    2. Making sure that the visitor has not brought shoes or clothing that may have been contaminated with animal matter.
    3. The desirability of using protective footwear and protective outer clothing while visiting premises where animals are maintained.
    4. Emphasize the intent of Veterinary Services to assist him in any way possible to make his stay in this country enjoyable and fruitful while at the same time soliciting his cooperation in order to protect this country against animal disease introduction.
- III. A supply of outer protective clothing and footwear of various sizes should be maintained as determined by each Regional Director at certain Veterinary Services headquarters, other governmental facilities handling livestock, and at facilities such as stockyards or markets. Sufficient supplies should be maintained to accommodate groups up to six persons. For larger groups, standby arrangements should exist for quick procurement of additional boots and outer clothing. For additional assistance, the appropriate Regional Director should be contacted.





- IV. The area VIC should consider assigning personnel, as necessary, to accompany the foreign visitors or to meet with them at their designated visiting locations to handle protective footwear and clothing and otherwise assure that such visits are not the means of introducing foreign animal diseases to susceptible species in this country. After at least 7 days have elapsed from the time that foreign visitors may have had contact with animals in foreign countries, and provided that they do not have uncleaned footwear or clothing that may have been used around such animals, the need for further surveillance or supervision is believed negligible.
- V. If the visitors will be making similar visits to other States, the area VIC should be promptly notified. This is especially necessary when the visitors have not been in this country more than 7 days.
- VI. A brief report should be kept on file covering the number of visitors, their countries of origin, dates of places visited, length of stay in this country, and precautionary measures taken by Veterinary Services personnel. This matter is of continuing importance to us, and of continuing interest to those outside Veterinary Services concerned about introduction of foreign animal diseases.

QUOTED FROM VETERINARY SERVICES MEMORANDUM 510.19 - APHIS



APPENDIX IIGUIDING PRINCIPLES IN THE CARE AND USE OF ANIMALS

Approved by the Council of the American Physiological Society

Only animals that are lawfully acquired shall be used in this laboratory, and their retention and use shall be in every case in strict compliance with State and local laws and regulations.

Animals in the laboratory must receive every consideration for their bodily comfort; they must be kindly treated, properly fed, and their surroundings kept in a sanitary condition.

Appropriate anesthetics must be used to eliminate sensibility to pain during operative procedures. Where recovery from anesthetics is necessary during the study, acceptable technique to minimize pain must be followed. Curarizing agents are not anesthetics. Where the study does not require recovery from anesthetics, the animal must be killed in a humane manner at the conclusion of the observations.

The postoperative care of animals shall be such as to minimize discomfort and pain and in any case shall be equivalent to accepted practices in schools of veterinary medicine.

When animals are used by students for their education or the advancement of science, such work shall be under the direct supervision of an experienced teacher or investigator. The rules for the care of such animals must be the same as for animals used for research.





BARC MEAT ANIMAL CARE  
FACILITY & ANIMAL INSPECTION FORM

CODE:

NOT APPLICABLE = 0  
 ACCEPTABLE = 1  
 UNACCEPTABLE = 2  
 REPAIR REQUIRED = 3  
 RENOVATION REQUIRED = 4

Inspector: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Building No. \_\_\_\_\_

WING OR SECTION OF BLDG.

I. Condition of Structure & Pens:

Screens  
 Windows  
 Doors  
 Floors  
 Pens & Gates  
 Walls/paint  
 Lighting/Drains  
 Scales

II. Housekeeping:

Floors  
 Walls  
 Ceilings  
 Trash  
 Security  
 Storage  
 Walkways

III. Animal Health, Sanitation & Cleanliness:

Floors  
 Walls  
 Slats  
 Far. Crates  
 Waterers  
 Feeders

Health and Condition of Animal

Fences  
 Space enough  
 Shade  
 Housing  
 Ground surface



## CHAPTER 422 BEEF

## Data Summary

## Space Requirements

## Feedlot, sq ft/head

20 in barn and	Lot surfaced, cattle have
30 in lot	free access to shelter
50	Lot surfaced, no shelter
150-800	Lot unsurfaced except around waterers, along bunks and open-front buildings, and a connecting strip between them
20-25	Sunshade

## Buildings with Feedlots, sq ft/head

20-25 600 lb to market

15-20 Calves to 600 lb

 $\frac{1}{2}$  ton head Bedding

## Cold Confinement Buildings, sq ft/head

30 Solid floor, bedded

17-18 Solid floor, flushing flume

17-18 Totally or partly slotted

100 Calving pen

1 pen 12 cows Calving space

## Feeders, in./head along feeder

All animals eat at once:

18"-22" Calves to 600 lb

22"-26" 600 lb to market

26"-30" Mature cows

14"-18" Calves

## Feed always available:

4"-6" Hay or silage

3"-4" Grain or supplement

6" Grain or silage

1 space/5 calves Creep or supplement

## Steers fed twice daily.

6"-9" indoors

12" outdoors

## Waterers

40 head/available water space in drylot.

Feeders: 15 gal/head/day; 5500 gal/head/year

Cows: 20 gal/day

## Isolation &amp; Sick Pens

40-50 sq ft/head

Pens for 2%-5% of herd

## Mounds

25 sq ft/head Minimum

50 If windbreak on top of mound; 25 sq ft/head each side

## Slopes

## Floors, Pavements

 $\frac{1}{2}$ "- $\frac{3}{4}$ " ft Bunk aprons with step1"-1 $\frac{1}{2}$ " ft Bunk aprons without step $\frac{3}{4}$ "-1 $\frac{1}{2}$ " ft Solid floors toward slats, flumes $\frac{1}{2}$ " or more Longitudinal, bottoms of gutters, flumes

1" Gravity pipe to lagoon

## Earth

4:1 to 5:1 Mound sideslopes

5% max Mound longitudinal

4%-6% Lots

## Daily Manure Production

60 lb, 1 cu ft Feces &amp; urine

6.91 lb, 0.12 cu ft Solids

## Cow-calf feed and space requirements.

Feed	pregnant cow	20-25 lb hay per day 40-50 lb corn silage
	lactating cow	30-35 lb hay per day 55-60 lb corn silage
Feeding space	calves	14"-18" per head 1 space/5 calves for creep or supplemental feeding
	cows	24"-30"
Bunk max throat height	calves	18"
	mature cows	22"
Water, max.	cow	20 gal/day
Calving pens		about 100 sq ft 8'x12'—easy to handle cow or 10'x10'
Calving space		one pen for each 12 cows

## Corral dimensions.

Use dimensions for over 1200 lb for cow-calf operations.

Over	To 600 lb	600-1200 lb	1200 lb
Holding area sq ft/head	14	17	20
Crowding pen sq ft/head	6	10	12
Working chute with vertical sides			
width	18"	22"	26"
Desirable length (min.)	20'	20'	20'
Working chute with sloping sides			
Width at bottom			
inside clear	15"	15"	16"
Width at top			
inside clear	20"	24"	26"
Desirable length (min.)	18'	18'	18'
Working chute fence			
Height—solid wall	45"	50"	50"
Depth of posts in ground	36"	36"	36"
Overall height (7' clear min. below cross ties to walk under)			
Top rail, farm cattle	55"	60"	60"
Top rail, range cattle	68"	72"	72"
Corral fence			
Recommended height	60"	60"	60"
Depth of posts in ground	30"	30"	30"
Loading chute			
Width	26"	26"	26"-30"
Length (min.)	12'	12'	12'
Rise in/ft	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Ramp height for:			
Gooseneck trailer	15"		
Pickup truck	28"		
Van type truck	40"		
Tractor-trailer	48"		
Double deck	100"		





# 420 LIVESTOCK

## CHAPTER 421 SWINE

As you consider alternatives, allow for:

Expansion, perhaps to twice the production you are now planning.

Your Neighbors, who may object to noise, odor, and dust from your business.

Regulations, which may dictate or limit building locations and waste disposal methods.

### Product To Be Marketed

Feeder pigs

Market weight hogs

Breeding stock

### Pasture vs Confinement

### Building System

### Summary of design data

	VENTILATION RATES			TEMPERATURE	SUPPLEMENTAL HEAT, Btu/hr						WASTE PRODUCTION	
	Winter		Summer	Winter Room	Slotted Floors		Bedded or Scraped Floor		Liquids + Solids			
	Minimum	Normal										
	cfm	cfm	cfm	°F	Cold	Mild <sup>2</sup>	Cold	Mild	cu ft	gal		
Sow and litter	20	80	210	65° 75°	1500	1000	2000 <sup>1</sup>	1400	0.54	4		
Pigs												
12-60 lb	2	15	36	70°	275 <sup>1</sup>	125 <sup>1</sup>	300 <sup>1</sup>	150 <sup>1</sup>	0.04	0.3		
60-125	5	20	48	60° ± 15°	250	100	500	200	0.11	0.75		
125-210	10	35	100 <sup>3</sup>	60° ± 15°				200	0.23	1.6		
Sow or boar, limit fed												
200-250 lb	10	35	120	60° ± 15°				200	0.14	0.94		
250-300	12	40	180	60° ± 15°				200	0.17	1.13		
300-500 & breeding	15	45	250	60° ± 15°				200	0.28	1.88		

<sup>1</sup>Provide radiant or floor brooder heat for pigs.

<sup>2</sup>On slotted floors, <sup>1</sup>/<sub>2</sub> continuous, <sup>1</sup>/<sub>2</sub> on thermostat.

<sup>3</sup>May need up to one 30" circulating fan/100 head in naturally ventilated buildings.

### FEEDER and WATERER SPACE

Self-feeders: one space/5 pigs.

Supplement feeders: one space/15 pigs.

Sow feeders: 1'/sow self-feed, 2'/sows all fed at once.

Waterers: one space/20 to 25 pigs.

### BUILDING FLOOR SPACE

Sows and Boars: 8 sq ft indoors, 12 sq ft outdoors.

Sow and Litter: 26 sq ft slotted floors.

or 32 sq ft indoors, 42 sq ft outdoors

Pigs to 60 lb: 3 sq ft

60 to 125 lb: 6 sq ft

125 and up: 8 sq ft

or 5 sq ft indoors, 9 outdoors.

### PASTURE SPACE

10 gestating sows/acre.

7 sows with litters/acre.

50 to 100 growing-finishing pigs/acre depending on fertility

### SHADE SPACE

15 to 20 sq ft/sow.

20 to 30 sq ft/sow and litter.

4 sq ft/pig to 100 lb.

6 sq ft/pig over 100 lb.

### SPRAY COOLING

Water = 0.09 gal/hr/pig.

Nozzle size = 0.045 gal/min/pig.

### Ventilation AIR INTAKE

Size in sq in =  $\frac{1}{4}(\text{cfm fan capacity})$ .

### FLOOR and LOT SLOPES

Slotted floors: usually flat:

Farrowing, solid floors:

$\frac{1}{2}$ " to  $\frac{3}{4}$ "/ft without bedding.

$\frac{1}{4}$ " to  $\frac{1}{2}$ "/ft with bedding.

Finishing:  $\frac{1}{2}$ " to  $\frac{3}{4}$ "/ft.

Paved lots:  $\frac{1}{4}$ " to 1"/ft.

Paved feeding floors:

Indoors:  $\frac{1}{4}$ "/ft minimum.

Outdoors: 1"/ft.

Building alleys:

$\frac{1}{2}$ "/ft cross slope for crown.

$\frac{1}{10}$ " to  $\frac{1}{4}$ "/ft to drain.

Gutters and pits:

1"/25' to 1"/100' to drains.

Pipes:

1  $\frac{1}{2}$ " (6" dia.)

1" (8" dia.)



Flushing Gutter: 1 1/2%.

#### Flushing intervals

	Minimum flushes per day	
	Under slats	Open gutter
Farrowing	2	—
Nursery	4	—
Finishing	6	12
Gestation	4	6

Note: Increasing the number of flushes per day tends to decrease odors.

#### Pumping Ports

Suction pump: 20' o.c.

Chopper pump: 40' o.c.

#### FLOOR THICKNESS

4": Feed aprons and floors with minimum vehicle traffic; building floors.

5": Paved feedlots; building drives.

6": Heavy traffic drives.

#### SLOT WIDTHS in slotted floors

New-born pigs<sup>1</sup>: 3/8" and 1".

12 to 60 lb:<sup>2</sup> 3/4" to 1".

60 to market: 1".

Sows and Boars: 1" - 1 1/4".

1" wide slots behind sows, 3/8" elsewhere; cover slots during farrowing.

3" width preferred over wider slats.

#### ALLEYS

##### Alley Slopes

1/2"/ft cross slope to form a crown.

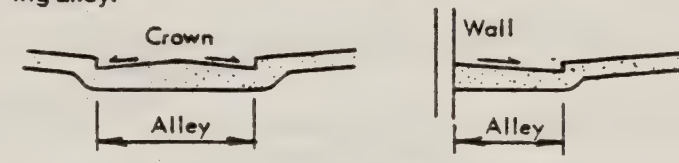
1/4"/ft to drains.

##### Alley Widths

Feeding alley, 4' for feed cart.

Sow handling alley, 3'.

Remodeling, as little as 2' for feeding or sow handling alley.







## CHAPTER 424 SHEEP

Up-to-date sheep housing and facilities save labor, protect animals, feed, and equipment; and aid effective management. Update or replace buildings when their usefulness is reduced or lost by wear and tear, or when changes in farm production systems make them obsolete. Increases in flock size and current economic and environmental factors encourage good management with well planned housing and facilities.

In the North Central Region, sheep are most commonly provided dry, cold, solid-floor housing with outside lots. However, slotted floors have been successfully used in complete confinement barns. For lambing in cold weather, provide a well-protected area in cold or warm housing.

In addition to shelter, needed facilities include feed storage, feeders and waterers, creepers, lambing pens, shearing area, hospital area, and corral.

## Data Summary

**Feeder space****Group-fed:**

16"-20"/ewe

9"-12"/feeder lamb

**Self-fed:**

10"-12" silage, 8"-10" hay/ewe

3"-4"/feeder lamb

**Waterer space****Per automatic bowl**

40-50 ewes or ewes with lambs

50-75 feeder lambs

**Per ft. of tank perimeter**

15-25 ewes or ewes with lambs

25-40 feeder lambs

**Shelter space****Open-front building with lot:**

10-12 sq ft/ewe

12-16 sq ft/ewe and lambs

6-8 sq ft/feeder lamb

**Lot:**

25-40 sq ft/ewe

25-40 sq ft/ewe and lambs

15-20 sq ft/feeder lamb

**Solid floor (confinement):**

12-16 sq ft/ewe

15-20 sq ft/ewe and lamb

8-10 sq ft/feeder lamb

**Slotted floor confinement:**

8-10 sq ft/ewe

10-12 sq ft/ewe and lamb

4-5 sq ft/feeder lamb

**Water consumption per day**

2 gal/ewe

2½ gal/ewe and lamb

1½ gal/feeder lamb

**Feed requirements per day****Hay:**

- 2½-4 lb/ewe, maintenance and early gestation—No supplement required

- 4-7 lb/ewe, late gestation and lactation—plus supplemental grain

**Haylage:**

- 5-7 lb/ewe, maintenance and early gestation—No supplement required

- 8-10 lb/ewe, late gestation and lactation—plus supplemental grain

**Corn silage:**

- 7-9 lb/ewe, maintenance and early gestation—plus protein and mineral supplement

- 12-20 lb/ewe, late gestation and lactation—plus protein and mineral supplement and occasionally grain

- 4-6 lb/feeder lamb, plus 1-2 lb/day grain and protein and mineral sup

**Grain:**

- ¾-1½ lb/ewe, late gestation and lactation

- 2-3 lb/feeder lamb, plus protein and mineral supplement

- 0.6-1 lb/lamb, creep feeding to weaning

**Protein supplement:**

- ⅛-¼ lb/ewe, maintenance and gestation

- ¼-½ lb/ewe, lactation

- ¼-½ lb/feeder lamb

**Provide lambing pens for:**

10%-15% of 100-ewe flock

7%-9% of 600-ewe flock

4%-6% of 1000-ewe flock

**Lambing pens (jugs) 4'x4'x30" or 4½' x4½' x36"; provide grain and water**

**Lamb creep space:**

1.5-2 sq ft/lamb

**Nursery pens for 2- to 4-day old lambs before putting into group pens:**

about 16'x16' for 20 ewes and 30 lambs

**Group pen size:**

about 125 to 150 ewes with singles

about 60 to 75 ewes with twins

**Manure production, raw waste, lb/day:**

6 lb, or 0.1 cu ft per ewe

4 lb, or 0.065 cu ft per lamb

**Warm housing:****Supplemental heat:**

1000-2000 Btu/hr per 1000 lb animal wt.

**Forced ventilation:**

25 cfm/1000 animal wt continuous winter minimum rate.

200 cfm/1000 lb animal weight, summer rate.



APPENDIX VIIVIRGINIA DEPARTMENT OF AGRICULTURE AND COMMERCE  
DIVISION OF ANIMAL HEALTH AND DAIRIES  
VIRGINIA HEALTH CERTIFIED SHEEP FLOCK PROGRAMI. Purposes

- A. The primary purpose of the Virginia Health Certified Sheep Flock Program is to establish and maintain flocks of sheep in the Commonwealth of Virginia that are free of certain infectious and contagious diseases. The value of such health status is unquestioned and of the utmost importance, both to the individual flock owner and to the Virginia sheep industry as a whole.
- B. A secondary purpose is to provide recognition of such health status of sheep flocks by official certification under the Program. Health certification will afford undoubted advantages to flocks so recognized in the sale of breeding and replacement stock.

II. How to Enroll

- A. The Virginia Health Certified Sheep Flock Program is a voluntary program. Participation in the Program must in all cases be initiated by the flock owner. Participation in the Program must include all of the sheep regardless of whether they constitute one flock or several flocks. To become a participant in the Program, the owner of the sheep must complete an Application for Participation (a copy of which is attached hereto) and forward it to the State Veterinarian. Continuation of participation is dependent upon the continued cooperation of the flock owner in all aspects of the Program.

III. Operation of Program

- A. The operation of the Virginia Health Certified Sheep Flock Program will be under the direction and supervision of the Division of Animal Health and Dairies, Virginia Department of Agriculture and Commerce, with the cooperation of the Virginia Cooperative Extension Service and the Virginia Sheep Breeders Association.
- B. Each participating flock will be inspected three times, at 6-month intervals, by a veterinarian of the Division of Animal Health and Dairies. Such flock inspections shall be at no expense to the flock owner, and he will be notified of the visit of the inspector prior to each inspection. These inspections will place particular emphasis on foot rot, scabies, sore mouth, and other contagious diseases of sheep.







- C. Any flock of sheep found on inspection to be infected with foot rot will be placed under the supervision of a State Regional Veterinarian. The sheep shall be handled and treated in a prescribed manner as recommended by the Division of Animal Health and Dairies.
- D. A State Regional Veterinarian will demonstrate the proper trimming of infected feet and the construction and use of an approved foot bath. It is the responsibility of the flock owner to administer the necessary treatments to eliminate this disease from his flock. A general discussion of foot rot in sheep and a guide to these procedures is to be found in the USDA Farmers Bulletin No. 2206 entitled "Foot Rot of Sheep."

#### V. Sheep Scabies

- A. Virginia sheep producers are quite familiar with the Scabies Eradication Program. This program is close to achieving its goal nationwide. Any flock participating in the Virginia Health Certified Sheep Flock Program in which scabies is diagnosed will immediately be placed under the Scabies Eradication Program.

#### VI. Other Contagious Diseases

- A. When a contagious disease occurs in a flock, the State or Regional Veterinarian is to be notified immediately.
- B. If a participating flock is found to be infected with any contagious disease other than foot rot or scabies, the flock owner will contact his local practicing veterinarian to assist him in eradicating such disease from his flock. He will be expected to follow his veterinarian's directions in all such cases.

#### VII. Virginia Sheep Breeders Association

- A. The Virginia Sheep Breeders Association is expected to publicize and explain the Virginia Health Certified Sheep Program to Virginia sheep breeders, and to lend its support to the Program.
- B. The Association is expected to create a Sheep Health Committee to work with the State Veterinarian, Extension Veterinarian, and the Extension Sheep Specialist in furtherance of the Program.
- C. The Association should plan eventually to accept at Association-sponsored shows and sales only sheep originating from Health Certified Sheep Flocks.





### VIII. Cooperative Extension Service

- A. The educational aspects of the Virginia Health Certified Sheep Flock Program shall be conducted by the Virginia Cooperative Extension Service.
- B. Extension personnel will assist the State Veterinarian in a survey to determine health of animals sold from Health Certified flocks.

### IX. Participating Flock Owners

- A. Owners and managers of flocks participating in the Virginia Health Certified Sheep Flock Program are expected to cooperate fully in aspects of the Program. Specifically, they shall:
  - 1. Report contagious diseases to the State or Regional Veterinarian when such outbreaks occur in his flock.
  - 2. Follow the instructions of the State or Regional Veterinarian when disease eradication procedures are necessary.
  - 3. Follow a health management program for the control of external and internal parasites as recommended by his veterinarian, Extension Sheep Specialist, Extension Veterinarian, or State Veterinarian.
  - 4. Follow sheep management practices such as rotation of pastures, vaccination program, sanitation, etc., which are applicable to his farm or State Regional Veterinarian.
  - 5. Take precautions to prevent flocks from becoming infected or re-infected.
    - a. Isolate newly purchased sheep not originating from a Health Certified flock.
    - b. Isolate for 30 days all sheep returning from shows or sales or that have been exposed to sheep of questionable status.
  - 6. Provide at their own expense, adequate equipment, holding and isolation pens, foot baths, medications, and manpower for any prescribed disease eradication procedures.







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